having normal eyesight without the use of corrective eyewear (e.g., not near- or far-sighted). As described herein, a "vision-corrected graphical output" may be used to refer to a graphical output of a graphical user interface that has been adapted to improve the clarity of the output for a user having a vision deficiency or a user that is viewing the screen using a corrective lens not adapted for close viewing. The vision-corrected graphical output may be selectively or entirely blurred; may overlay a, for example, grid-like filter over a standard graphical output; may present the graphical output and/or certain graphical elements as larger, brighter, with a different color palate, and the like; and may include other vision-correcting techniques.

**[0040]** As discussed herein, a user may have difficulty perceiving a standard graphical output depending on the user's visual acuity and depending on a corrective eyewear scenario of the user. As used herein, a "corrective eyewear scenario" may refer to a presence, or lack of presence, of corrective eyewear on a user's face. Depending on a corrective eyewear scenario of the user, the user may have difficulty perceiving a standard graphical output. For example, a myopic (e.g., nearsighted) user may be able to easily perceive a standard graphical output while not wearing corrective eyewear, but may have difficulty perceiving the standard graphical output while wearing corrective eyewear (e.g., the corrective eyewear may improve the user's vision for far away objects while hindering the user's vision for nearby objects). Likewise, a hyperopic (e.g., farsighted) user may experience the opposite effect and may be able to easily perceive a standard graphical output while wearing corrective eyewear, but may have difficulty perceiving the standard graphical output while not wearing corrective eyewear.

**[0041]** In various embodiments presented herein, an electronic device may present a vision-corrected graphical output to a user who would ordinarily have difficulty perceiving a standard graphical output. Further, an optical sensor system may detect the presence of corrective eyewear and may switch between a standard graphical output and a vision-corrected graphical output depending on whether a user is wearing the corrective eyewear or not, as determined by comparing the user's appearance with a set and/or subset of identity maps, as described herein. For example, an electronic device may present a myopic user with a standard graphical output when the user is not wearing corrective eyewear and may present the user with a vision-corrected graphical output when the user wearing the corrective eyewear. In some embodiments, many display profiles may be associated with a single user having multiple corrective eyewear.

**[0042]** In various embodiments, a vision-corrected graphical output includes graphical elements of a graphical user interface that appears clear to a user having a visual deficiency and/or may otherwise correspond to varying levels of vision correction. Many different types of vision-corrected graphical outputs may be provided and each vision-corrected graphical output may correspond to a different vision condition of a user and/or to a presence of corrective eyewear worn by a user, as determined by a facial scan of a user's face by, for example, an optical sensor system. For example, a user who has hyperopic vision (e.g., a user who is farsighted), may have difficulty perceiving nearby objects (e.g., a display on a mobile phone) without the use of corrective eyewear, but may be able to easily perceive the same nearby objects when wearing the corrective eyewear. For such a user, the electronic device may present a standard graphical output when the user is wearing the corrective eyewear and may provide a vision-corrected graphical output when the user is not wearing the corrective eyewear. As such, a vision-corrected graphical output corresponding to a myopic vision deficiency may exhibit different characteristics than a vision-corrected graphical output corresponding to a hyperopic vision deficiency. Many types of visual deficiencies are considered, including myopia, hyperopia, astigmatism, presbyopia and higher-order aberrations that may be difficult to correct with eyeglasses. The systems and techniques described herein may also be used to account for different vision-related perception issues that may not be formally classified as a vision deficiency. For example, the systems and techniques described herein may be used to account for a user's aversion or preference to bright or flashing light sources, aversion or preference to a particular color, tint, or hue, or other vision-related aversion or preference. The following techniques may also be applied to help compensate for colorblindness or other visual perception issues.

**[0043]** As discussed herein, many such vision-corrected graphical outputs, corresponding to different vision deficiencies, are considered. Specifically, a display may be driven in accordance with a display profile or a display setting profile that is used to produce, what is referred to herein as a vision-corrected graphical output. In some embodiments, a vision-corrected graphical output may be produced on a display of an electronic device by pre-sharpening a two-dimensional image presented on the display using the inverse point spread function of a user's eye. Some embodiments of a vision-corrected graphical output include a multilayer display with prefiltered image generation, a tailored, ray-traced display that produces a light field via lenslet arrays, and a combination light field display with computational prefiltering. Additionally or alternatively, a four-dimensional light field display with parallax barriers and/or lenslet arrays may be used to counteract a user's vision deficiency. In some embodiments, refractions and aberrations of a user's eye, as derived from a user's prescription, may be mathematically modeled and a processor of an electronic device may use the mathematical representation to present a four-dimensional light field, via a display, to the user so that a two-dimensional image with high clarity is perceived by the user. In some embodiments, a pinhole parallax barrier may be provided, either digitally or as a physically separate barrier, to optimize light throughput. These techniques are provided by way of example and other techniques not expressly listed above, may be used to produce a vision-corrected graphical output.

**[0044]** In some cases, the vision-corrected output is adapted to account for different levels of vision correction in each of the user's eyes. For example, multiple outputs, each output configured to provide a different level or different type of vision compensation, may be presented to the user as a composite vision-corrected output. In some embodiments, multiple images may be presented at different angles to the user at the same time. In this way, the user may perceive a three-dimensional image on the two-dimension display. Additionally or alternatively, the multiple images presented at different angles may be individually generated to compensate for vision deficiencies of individual eyes. For example, a user may have a certain prescriptive value